

NON-PUBLIC?: N
ACCESSION #: 9408010186
LICENSEE EVENT REPORT (LER)

FACILITY NAME: River Bend Station PAGE: 1 OF 5

DOCKET NUMBER: 05000458

TITLE: Loss of Shutdown Cooling Due to Inadvertently Dropped
Lead
EVENT DATE: 06/23/94 LER #: 94-018-00 REPORT DATE: 07/22/94

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 4 POWER LEVEL: 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: T. W. Gates, Supervisor - Nuclear TELEPHONE: (504) 381-4866
Licensing

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

As a result of River Bend Station's (RBS) pre-outage risk assessment, procedure TP-94-0010, "Shutdown Cooling Reliability During Refueling Outages," was developed to add special precautions to reduce the potential for losses of shutdown cooling (SDC). At 0507 on June 23, 1994 with the unit in operational condition 4 (cold shutdown), a fuse was blown during restoration of the plant from the TP-94-0010 configuration. The fuse blew due to a short created by a dropped lead. The blown fuse caused an isolation of the Residual Heat Removal System (RHR) and resulted in the only loss of SDC event that occurred during the outage.

The root cause of this event was personnel error due to an electrical shock received by the technician when removing a jumper. Corrective actions to prevent recurrence include an evaluation to enhance the human engineering aspects of this activity and adding an additional barrier to

prevent a loss of SDC during shutdown conditions. The additional barrier may be established by re-sequencing the steps in the procedure such that the RHR suction isolation valves will be de-energized while connecting and disconnecting the jumpers.

This event was of no safety significance. Shutdown cooling was lost for approximately 18 minutes and only a slight increase of the reactor coolant temperature (less than 2 degrees Fahrenheit) was experienced. Alternate shutdown cooling was available via Reactor Water Clean-Up system but was not required.

END OF ABSTRACT

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REPORTED CONDITION

At 0507 on June 23, 1994 with the unit in operational condition 4 (cold shutdown) a fuse (*FU*) was blown during the performance of temporary procedure TP-94-0010, "Shutdown Cooling Reliability During Refuel Outages." The fuse blew due to a short created by a dropped lead. The blown fuse resulted in a loss of power to the control logic of the RHR System (*BO*). This loss of control power caused an automatic isolation of the RHR suction valve (*ISV*) and consequently tripped the running RHR pump (*P*) (train A). The event resulted in a loss of SDC for approximately 18 minutes. This report is submitted pursuant to 10 CFR 50.73(a)(2)(iv) to document this ESF actuation.

INVESTIGATION

Before refueling outage 5 (RF-5), RBS performed a risk evaluation to study ESFs involving losses of SDC. One recommendation from this evaluation was to bypass the reactor pressure isolation logic of the RHR system during selected periods of the refueling outage. TP-94-0010 was developed and issued to implement this recommendation. This procedure specified steps for de-energizing selected isolation valves and bypassing selected system logic for the purpose of reducing the potential for losses of SDC during RF-5. The TP did serve to prevent several potential loss of SDC events during RF-5. The event described in this LER was the only loss of SDC event during the outage.

On June 23, 1994, two I&C technicians were assigned to restore the reactor pressure isolation logic of the RHR system as directed in TP-94-0010. During the restoration, the jumper that had been installed to bypass this logic was being removed. When the jumper was being removed, the technician's finger inadvertently contacted the uninsulated tip of

the jumper and the technician received an electrical shock. The technician's involuntary reaction caused him to drop the jumper. The jumper contacted the shell of the electrical cabinet and the circuit was shorted to ground. The short created an overcurrent condition and blew the circuit's fuse. The blown fuse caused the actuation of several relays and resulted in an isolation and subsequent trip of RHR pump A. At the time of this event, RHR train A was operating in the SDC mode.

During the performance of this procedure, the technician was in compliance with the site's safety procedure for conducting work around low voltage energized circuits. The shock received by the technician was approximately 120 volts and medical attention was not required or needed.

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INVESTIGATION (Continued)

Before performing this task, the technician had been cautioned several times to be careful when removing the jumper. The sensitive nature of this activity was discussed in detail with the technician during the job pre-briefing and was clearly stated in the "Precautions and Limitations" section of the TP. Specifically, the TP stated that a potential for an ESF actuation existed during the installation and removal of this jumper and that the shorting of the jumper to the cabinet would result in an ESF actuation.

RBS has submitted three LERs in the past two years involving ESF actuations due to mishandled test leads. These are LERs 93-016, 93-017 and 93-018. LER 93-016 documents a high pressure core spray actuation that resulted when two lifted leads shorted against each other due to a procedural inadequacy. LER 93-018 documents a reactor core isolation cooling event due to a technician connecting M&TE to the wrong terminals during the performance of a surveillance. LER 93-017 documents a main steam isolation valve closure and reactor trip when technicians shorted M&TE equipment while troubleshooting the steam bypass and pressure regulating system. Of these three LERs, the circumstances in LER 93-017 have the greatest similarity to 94-018; however, the root cause indicated in LER 93-017 was that management policies and expectations were not effectively communicated. In LER 94-018, the root cause is limited to personnel error by the technician in his handling of the test leads.

ROOT CAUSE

The root cause of this event was personnel error in that the technician allowed his finger to contact an energized uninsulated conductor.

Physical space limitation within this electrical cabinet was a contributing cause of this event. The jumper was in a cramped location and the banana jack was within approximately 1/2 inch of the cabinet's metal case.

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CORRECTIVE ACTION

The immediate corrective actions were to replace the blown fuse, re-establish shutdown cooling and complete the restoration of the RHR system per the TP. Additionally, this event was discussed with all I&C technicians. The discussion stressed equipment and personnel safety awareness when working on energized circuits.

Two specific corrective actions will be taken to prevent recurrence of this event and are as follows:

- An additional barrier to prevent a loss of SDC event during refueling conditions will be established before RF-6. This may include a revision to the TP which will re-sequence the steps in the procedures such that the RHR suction isolation valves will be de-energized while connecting and disconnected the jumpers.
- Enhancement of the human engineering aspects associated with the banana jacks and jumpers used for the performance of this TP will be evaluated. Improvements such as repositioning the installed banana jacks and replacing the existing jumpers with jumpers having special protective insulation features are being considered.

Generic actions being taken to address ESF actuations at RBS have been described in LERs 94-013 and 94-014. These actions include the following elements:

- Before refueling outage 5 (RF-5), RBS performed a risk evaluation to study ESFs involving losses of shutdown cooling. This effort has contributed to limiting the challenges to shutdown cooling during RF-5.
- During the course of RF-5, RBS initiated a limited study to review other types of outage-related ESF actuations that occurred during previous refueling outages. This study compared ESF actuations occurring in previous outages with those that had occurred in RF-5 through June 2, 1994. Engineered safety feature actuations for RF-5 included in this study are documented in LERs 94-007, 94-011, 94-013 and 94-014. The objective of this review was to identify

commonalities between RF-5 events and previous events.
Recommendations to reduce the potential for future outage-related
ESF actuations were developed.

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CORRECTIVE ACTION (Continued)

- The scope of this review will be expanded to include ESF actuations occurring during operating conditions as well as outage-related ESF actuations. This evaluation will be completed by October 31, 1994.
- Plant maintenance is establishing a multi-discipline team to evaluate practices and processes that will apply to all surveillances and maintenance work. The goal of this team will be to identify improvements to reduce testing errors and thus, ESF actuations. Improvements in the area of work practices, testing methods, and plant testability will be considered. In addition, this team will establish an improved process for providing test jacks on terminals to facilitate periodic testing.

SAFETY ASSESSMENT

The RHR shutdown cooling suction valve closed as designed upon the loss of control power. Shutdown cooling via RHR A was restored in approximately 18 minutes. Only a nominal increase (less than 2 degrees Fahrenheit) in reactor coolant temperature was experienced during this event. The Reactor Water Clean-Up system was available as an alternate SDC system and would have been capable of providing adequate shutdown cooling during this event if required. Therefore, this event was of no safety significance.

NOTE: Energy Industry Identification System Codes are identified in the text as (*XX*).

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ENTERGY

Entergy Operations, Inc.
River Bend Station
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July 22, 1994

U.S. Nuclear Regulatory Commission
Document Control Desk
M/S P1-37
Washington, D.C. 20555

Subject: River Bend Station - Unit 1
Docket No. 50-458
License No. NPF-47
Licensee Event Report 50-458/94-018-00
File Nos.: G9.5, G9.25.1.3

RBG- 40746

Gentlemen:

In accordance with 10CFR50.73, enclosed is a Licensee Event Report.

Very truly yours,

James J. Fisicaro
Director - Nuclear Safety

JJF/jcm
enclosure

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Licensee Event Report 94-018-00
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RBG- 40746
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